

REMARKS

Summary of the Office Action

The disclosure is objected to for improper incorporation by reference of alleged essential material.

Claims 1-6 stand rejected under 35 U.S.C. § 112, second paragraph.

Claims 1, 7, 11, 13, 14, and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuno et al. (US 6,265,262 B1) in view of Yang et al. (US 2002/0022334 A1) and Lou (US 6,143,605).

Claim 2, 5, 7-10, 12, 14, and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuno et al. in view of Yang et al., Iizuka (US 6,338,996 B1), and Lou.

Claims 3, 4, and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuno et al. in view of Yang et al., Iizuka, and Lou and further in view of Graettinger et al. (US 6,348,709 B1).

Summary of the Response to the Office Action

Applicant has amended the claims to correct minor informalities. Applicant respectfully asserts that the amendments do not relate to any issue of patentability and do not narrow the intended scope of the claims. Accordingly, claims 1-16 are pending for consideration.

Objection to the Specification

The Office Action states that “[t]he incorporation of essential material in the specification by reference to a foreign application or patent, or to a publication is improper, and requires the Applicant to amend the disclosure to include the material incorporated by

reference.” Applicant is respectfully unaware of a reason or determination that any material incorporated by reference is essential material. Applicant respectfully submits that MPEP § 608.01(p) I.A.2. and Form Paragraph 6.19 apply to incorporation of essential material. MPEP § 608.01(p)(I)(A) states that “[n]one essential subject matter may be incorporated by reference to (1) patent or application published by the United States or foreign countries...,” and that “[n]onessential subject matter is subject matter referred to for purposes of indicating the background of the invention or illustrating the state of the art.” Accordingly, Applicant respectfully asserts that incorporation by reference of the priority document in the instant application is proper since the priority document is not considered to contain essential subject matter. For the reasons above, Applicant respectfully requests withdrawal of the objection to the specification.

All Claims Comply with 35 U.S.C. § 112

Claims 1-16 stand rejected under 35 U.S.C. § 112, second paragraph. Applicant has amended claim 1 in accordance with the Examiner’s suggestions. Applicant respectfully asserts that the amendments do not relate to any issue of patentability and do not narrow the intended scope of the claims. Applicant respectfully submits that the limitations recited by claim 16 are correct. Accordingly, Applicant respectfully submits that claims 1-16 comply with 35 U.S.C. § 112, second paragraph, and respectfully request that the rejection be withdrawn.

All Claims Define Allowable Subject Matter

Claims 1, 7, 11, 13, 14, and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuno et al. (US 6,265,262 B1) in view of Yang et al. (US 2002/0022334 A1)

and Lou (US 6,143,605), claim 2, 5, 7-10, 12, 14, and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuno et al. in view of Yang et al., Iizuka (US 6,338,996 B1), and Lou, and claims 3, 4, and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuno et al. in view of Yang et al., Iizuka, and Lou and further in view of Graettinger et al. (US 6,348,709 B1). Applicant respectfully traverses these rejections for the following reasons.

Independent claim 1 recites a method for manufacturing a capacitor include at least the step of forming a BST dielectric film on said first electrode with said forming said BST dielectric sequentially including performing a NH₃-plasma process, performing a N₂O-plasma process, and depositing BST.

The Office Action recognizes that Okuno et al. does not disclose at least the claimed step of forming a BST dielectric film on a first electrode sequentially including performing a NH₃ plasma process, performing a N₂O plasma process, and depositing BST. However, the Office Action relies upon Yang et al. for allegedly teaching (paragraph [0047]) formation of a first barrier layer 250 by plasma-assisted oxidation of a metal nitride bottom electrode 245, and deposition of a BST dielectric layer 255 on the first barrier layer 250. However, Yang et al. does not teach or suggest sequentially performing a NH₃ plasma process and performing a N₂O plasma process, as recited by independent claim 1. In fact, Yang et al. appears to be completely silent with respect to sequential NH₃ plasma processing and N₂O plasma processing. In addition, Iizuka, Lou and Graettinger et al. are not relied upon for teaching or suggesting such steps. Moreover, Applicant respectfully asserts that Iizuka, Lou and Graettinger et al. cannot remedy this deficiency.

Since Okuno et al., Yang et al., Iizuka, Lou and Graettinger et al. fail to teach or suggest, singularly or in combination, all of the features of independent claim 1, the Office Action fails to establish a *prima facie* case of obviousness. MPEP § 2143.03 instructs that “[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 409 F.2d 981, 180 USPQ 580 (CCPA 1974).” Accordingly, because the applied art, whether taken singly or combined, does not teach or suggest **all the claim limitations**, Applicant respectfully asserts that the Office Action has not established a *prima facie* case of obviousness. If the Office Action is relying on some other rationale, Applicant traverses such an assertion and request identification of a reference in support of such rationale in accordance with MPEP § 2144.03.

For the above reasons, Applicant respectfully asserts that the rejections under 35 U.S.C. § 103(a) should be withdrawn because Okuno et al., Yang et al., Iizuka, Lou and/or Graettinger et al., whether taken individually or in combination, neither teach nor suggest the novel combination of features clearly recited in independent claim 1, and hence dependent claims 2-16.

CONCLUSION

In view of the foregoing, Applicants respectfully request reconsideration and the timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of the response, the Examiner is invited to contact the Applicants’ undersigned representative to expedite prosecution.

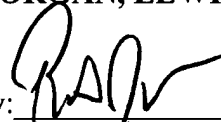
Attached hereto is a marked-up version of the changes made by the current amendment.

The attachment is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**"

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claim 1 has been amended as follows:

1. (Amended) A method of manufacturing a capacitor in semiconductor devices, the method comprising:

forming a silicon oxide film on a surface of a silicon substrate;

forming a nitride film on said silicon oxide film;

forming a contact hole by sequentially etching a portion of said nitride film and said silicon oxide film;

depositing a doped polysilicon layer over the entire surface of said silicon substrate, said doped polysilicon layer filling said contact hole;

performing an etch-back process to remove a portion of said doped polysilicon layer, said etch-back process leaving said doped polysilicon layer in said contact hole;

forming an ohmic contact layer over said doped polysilicon layer in said contact hole;

forming an anti-diffusion film on said ohmic contact layer;

forming a silicate glass film over the entire surface of said silicon substrate including said anti-diffusion film;

forming a concave hole by etching a portion of said silicate glass film, said concave hole having an internal wall;

forming a first electrode on said internal wall of said concave hole;

forming a BST dielectric film on said first ~~[Ruthenium]~~ electrode, said forming said BST dielectric sequentially including performing a NH₃-plasma process, performing a N₂O-plasma process, and depositing BST;

crystallizing said BST dielectric film, said crystallizing including performing a rapid thermal process;

forming a second electrode on said BST dielectric film, said BST dielectric film and said first and second electrodes forming ~~[a]~~ said capacitor; and

performing a thermal treatment to stabilize said capacitor.